

Claims 1-9 (canceled).

10. (currently amended) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:
- inserting a ~~plurality of wells~~ single well into the mantle substance;
  - forming a reaction cavity in the mantle substance with the reaction cavity connected to the single well, wherein the reaction cavity includes a reaction cavity surface;
  - applying water through a ~~first~~ the single well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;
  - controlling the release of the hydrogen by changing the water volume in the reaction cavity;
  - regenerating periodically the reaction cavity surface involved in the reaction; and
  - extracting the hydrogen from the reaction cavity out of a ~~second~~ the single well.

Claims 11-14 (canceled).

15. (currently amended) The method according to claim 10, wherein the step of forming the reaction cavity includes the step of:
- reaming ~~at least one of the first and second wells~~ the single well.

16. (currently amended) The method according to claim ~~[[12]]~~ 15, wherein the step of forming the reaction cavity includes the step of:  
reaming ~~at least one of the first and second wells~~ the single well using the turbodrills.

17. (currently amended) The method according to claim 15, wherein the step of reaming is performed by an explosion of explosive materials.

Claim 18 (canceled).

19. (previously presented) The method according to claim 10, wherein the step of regenerating the reaction cavity surface is performed by high-pressure water flow.

20. (previously presented) The method according to claim 19, further comprising the steps of:  
installing a nozzle in the reaction cavity for providing the high-pressure water flow.

21. (previously presented) The method according to claim 20, wherein the step of installing includes:  
installing the nozzle using a remotely controlled manipulator system.

22. (previously presented) The method according to claim 10, further comprising:  
installing a separator to divide the released hydrogen from any water vapors.

23. (previously presented) The method according to claim 22, wherein the released hydrogen is in gaseous form prior to division from the water vapors by the separator.

Claims 24-25 (canceled).

26. (previously presented) The method according to claim 10, further comprising:  
utilizing heat energy discharged during the release of the hydrogen.

27. (currently amended) An improved method of using the Earth mantle substance to produce hydrogen, including exploring continental and oceanic rifting areas supported by abnormal mantle diapirs with the mantle substance near the crust of the Earth; inserting a ~~plurality of wells~~ production well into the mantle substance; applying water through a water well ~~of the plurality of wells~~ to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen; and extracting the hydrogen out of ~~[[a]] the production well of the plurality of wells~~, the improvement comprising the steps of:

using a single well as both the production well and the water well;

after inserting the ~~plurality of wells~~ single well as both the production well and the water well into the mantle substance, forming a reaction cavity in the mantle substance with the reaction cavity being connected to the single well, wherein the reaction cavity includes a reaction cavity surface;

controlling the release of the hydrogen by changing the water volume in the reaction cavity; and

regenerating periodically the reaction cavity surface involved in the reaction.

Claim 28 (canceled).

29. (currently amended) The improved method of claim ~~[[28]]~~ 27, wherein the step of forming the reaction cavity includes the step of:

reaming ~~at least one of the single well as both~~ the water well and the production well to form the reaction cavity connected to the single well.

30. (new) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:

inserting a plurality of wells into the mantle substance by drilling using turbodrills;

forming a reaction cavity in the mantle substance, wherein the reaction cavity includes a reaction cavity surface;

applying water through a first well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;

controlling the release of the hydrogen by changing the water volume in the reaction cavity;

regenerating the reaction cavity surface involved in the reaction; and

extracting the hydrogen out of a second well.

31. (new) The method according to claim 30, wherein the step of forming the reaction cavity includes the step of:

drilling a linkage between the first and second wells using the turbodrills, wherein the linkage includes the reaction cavity.

32. (new) The method according to claim 30, wherein the step of forming the reaction cavity includes the step of:

reaming at least one of the first and second wells using the turbodrills.

33. (new) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:

inserting a plurality of wells into the mantle substance;

forming a reaction cavity in the mantle substance by reaming at least one of the first and second wells, wherein the reaction cavity includes a reaction cavity surface;

applying water through a first well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;

controlling the release of the hydrogen by changing the water volume in the reaction cavity;

regenerating the reaction cavity surface involved in the reaction; and

extracting the hydrogen out of a second well.

34. (new) The method according to claim 33, wherein the step of reaming is performed by explosion of explosive materials.

35. (new) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:

- inserting a plurality of wells into the mantle substance;
- forming a reaction cavity in the mantle substance, wherein the reaction cavity includes a reaction cavity surface;
- applying water through a first well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;
- controlling the release of the hydrogen by changing the water volume in the reaction cavity;
- periodically regenerating the reaction cavity surface involved in the reaction; and
- extracting the hydrogen out of a second well.

36. (new) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:

inserting a plurality of wells into the mantle substance;

forming a reaction cavity in the mantle substance, wherein the reaction cavity includes a reaction cavity surface;

applying water through a first well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;

controlling the release of the hydrogen by changing the water volume in the reaction cavity;

regenerating the reaction cavity surface involved in the reaction by high-pressure water flow; and

extracting the hydrogen out of a second well.

37. (new) The method according to claim 36, further comprising the steps of: installing a nozzle in the reaction cavity for providing the high-pressure water flow.

38. (new) The method according to claim 37, wherein the step of installing includes:

installing the nozzle using a remotely controlled manipulator system.



39. (new) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:

inserting a plurality of wells into the mantle substance;

forming a reaction cavity in the mantle substance, wherein the reaction cavity includes a reaction cavity surface;

applying water through a first well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;

controlling the release of the hydrogen by changing the water volume in the reaction cavity;

regenerating the reaction cavity surface involved in the reaction;

extracting the hydrogen out of a second well; and

installing a separator to divide the released hydrogen from any water vapors.

40. (new) The method according to claim 39, wherein the released hydrogen is in gaseous form prior to division from the water vapors by the separator.

41. (new) The method according to claim 39, wherein the separator is installed on the second well.

42. (new) The method according to claim 39, wherein the separator is installed on an outlet associated with at least one of the plurality of wells.

43. (new) A method of using the Earth mantle substance to produce hydrogen, the method comprising the steps of:
- inserting a plurality of wells into the mantle substance;
  - forming a reaction cavity in the mantle substance, wherein the reaction cavity includes a reaction cavity surface;
  - applying water through a first well to the reaction cavity to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen;
  - controlling the release of the hydrogen by changing the water volume in the reaction cavity;
  - regenerating the reaction cavity surface involved in the reaction;
  - extracting the hydrogen out of a second well; and
  - utilizing heat energy discharged during the release of the hydrogen.

44. (new) An improved method of using the Earth mantle substance to produce hydrogen, including exploring continental and oceanic rifting areas supported by abnormal mantle diapirs with the mantle substance near the crust of the Earth; inserting a plurality of wells into the mantle substance; applying water through a water well of the plurality of wells to interact with intermetallic compounds contained in the mantle substance, thereby causing a reaction of the water with the intermetallic compounds to release hydrogen; and extracting the hydrogen out of a production well of the plurality of wells, the improvement comprising the steps of:

after inserting the plurality of wells into the mantle substance, forming a reaction cavity in the mantle substance by reaming at least one of the water well and the production well, wherein the reaction cavity includes a reaction cavity surface;

controlling the release of the hydrogen by changing the water volume in the reaction cavity; and

regenerating periodically the reaction cavity surface involved in the reaction.